

## PATENT COOPERATION TREATY

PCT

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 4670/C	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/ES99/00406	International filing date (day/month/year) 28/12/1999	Priority date (day/month/year) 30/12/1998
International Patent Classification (IPC) or national classification and IPC B62K21/02		
Applicant ELIZALDE BERTRAND, Juan		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 7 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 11 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☒ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 24/07/2000	Date of completion of this report 05.04.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Fuchs, A Telephone No. +49 89 2399 2987 

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/ES99/00406

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, pages:**

**1-8** as received on 21/12/2000 with letter of 20/12/2000

**Claims, No.:**

1-5 as received on 21/12/2000 with letter of 20/12/2000

**Drawings, sheets:**

1/2,2/2 as received on 21/12/2000 with letter of 20/12/2000

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

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☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

**see separate sheet**

6. Additional observations, if necessary:

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Yes:	Claims	2-5
	No:	Claims	1
Inventive step (IS)	Yes:	Claims	2-5
	No:	Claims	1
Industrial applicability (IA)	Yes:	Claims	1-5
	No:	Claims	

2. Citations and explanations  
**see separate sheet**

## VI. Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

**see separate sheet**

## VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

**see separate sheet**

## VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

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**Re Item I**

**Basis of the opinion**

The amendments filed with the International Bureau by applicant's letter dated 20.12.2000 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34 2) b) PCT. In claim 1 the module 3 has been defined as a "die-shaped six-side module". As no base for a "die-shaped" module could be found in the originally filed documents, this feature can not be taken in consideration for the establishment of the preliminary international opinion (Rule 70 2) c) PCT). The wording of this feature in the originally filed claim 1 ("a module") is therefore assumed in Item V.

**Re Item VIII**

**Certain observations on the international application**

In claims 3 to 5, features (box of the module, longitudinal walls, pins,...) which are only introduced in claim 2, are further defined. These claims should therefore not refer back to claim 1.

In Item V it is assumed that claims 3 to 5 are dependent from claim 2.

**Re Item V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Following documents are cited in the present communication :

- US-A-4638881 (=D1)
- US-A-5503244 (=D2)
- EP-A-0469475 (=D3)

1. **Claim 1**

The following features are known from the prior art and are disclosed in combination in D1 Fig. 2 :

a two-wheeled vehicle with its front and rear wheels interconnected (column 1 lines 7-15), the steering column being dispensed with, and a module 41 attached to the rotation axle 46 of the front wheel 45 is connected *at least* to an upwardly inclined member 25 which is further extended downwardly and is articulated at its other end (A) to an end of a longitudinal bar 2 for connection to the rear wheel 35 of the vehicle.

All features of claim 1 being disclosed in D1, its subject-matter lacks novelty in the sense of Article 33 (2) PCT as compared to that of D1. It should be noted that the vehicle disclosed in D2 would also take novelty of the subject-matter of present claim 1.

2. Dependent claims 2 to 5

2.1 The subject-matter of claim 2 differs from that of D1, considered to represent the closest prior art, by that the module is formed by a parallelepipedal body constituting a box, and includes pins projecting outwardly from the surfaces of the upper and lower walls. The subject-matter of claim 2 is therefore novel in the sense of Article 33 (2) PCT, as compared to that of D1.

The technical effect of this features, is that module is located in the central portion of the steerable wheel, so that the lateral movement (steering) of the wheel can be increased. This corresponds to the problem to be solved by the present application (page 4 paragraph 2).

In D1, due to the steering plate extending upwardly (see column 5 lines 48-61), the lateral movement would be reduced as compared to the present solution. Furthermore, due to the lateral position of joints 40a, 40b on the steering plate, the rotation axle 46 of the front wheel is offset from the plane of symmetry of said wheel (Fig. 6), which has a negative impact on the stability.

The distinguishing features of claim 2 are disclosed in D3 (column 3 lines 1-19), but no indication could be found which would lead the skilled person to introduce such features in the solution according to D1 in order to solve the stated problem. In D2 (Fig. 3), the pins 3 extend inwardly from the upper and lower walls of module 5, to form the steering axle. Such features could not be introduced in D1.

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The subject-matter of claim 2 would therefore involve an inventive step in the sense of Article 33 (3) PCT.

2.2 Claims 3 to 5 are dependent from claim 2 (see Item VIII) and would therefore also meet the requirements of the PCT.

**Re Item VI**

**Certain documents cited**

According to Rule 70.10 PCT, document JP-A-11079042 Patent Abstract of Japan (=D4) is cited under Rule 64.3 PCT. D4 has been filed the 13.09.1997, which is before the priority date of the present application, and published the 23.03.1999, which is after said priority date. If a PCT or European application is validly claiming priority of D4, such an application would be relevant under Article 54 (3) and (4) EPC in the European procedure.

**Re Item VII**

**Certain defects in the international application**

- Contrary to Rule 6.3(b) PCT, claim 1 is not in the two-part form which in the present case would be appropriate, with those features known in combination from the closest prior art D1 being placed in a preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in a characterising part (Rule 6.3(b)(ii) PCT).
- Contrary to Rule 6.2 (b) PCT, the features of the claims are not *consistently* provided with reference signs placed in parenthesis.

The subject of the present patent of invention is a method of interconnecting the front and rear wheels in two-wheeled vehicles and a vehicle produced in accordance with the method.

5

Conventionally, the steering column of the steerable wheel of a two-wheeled vehicle is positioned above the steerable wheel, within the plane of symmetry thereof, and displaced rearwardly, forming a small angle to the  
10 vertical, this characteristic enabling the wheel to be steerable.

Stability and manoeuvring at low speed are achieved by balancing performed by the rider.

15

Stability at faster speeds of more than approximately 20 km per hour is achieved by the rotation of the wheels and the resulting gyroscopic forces. Manoeuvring is performed by moving the body weight towards the inside  
20 of the turn and/or by an appropriate slight turning pressure on the steerable wheel.

In motorized bicycles, conventional motorcycles and the like, the front and rear wheels of the vehicle are  
25 connected to one another by means of the steering column which is disposed above the front wheel so that a stable equilibrium is developed, provided that the paths of both wheels are identical. If this is not the case for various reasons such as bouncing of a wheel, a sideways  
30 movement due to skidding, or any other reason, the couples exerted by the wheels on the steering column may produce opposing force components which unbalance the vehicle because the paths are altered momentarily in opposite directions, since the couple on the rear wheel



is borne by the steering column but not by the front wheel axle.

5 These unequal steering forces, which are created momentarily, may and do give rise to force components that unbalance the vehicle, which may cause both the vehicle and its rider to fall over.

10 The necessary correction of this instability, which is not always successful, is achieved in most cases by the well-directed effort of an experienced rider.

15 Prototypes in which an attempt to achieve this objective is indicated have been disclosed in motorcycling magazines. However, this is applicable only to racing motorcycles, owing to their large size which is necessary to achieve maximum power within their cylinder capacity.

20 This larger size permits the arrangement of the complex structural components which are necessary in order partially to achieve the desired result.

25 These solutions cannot be applied to motorcycles for general use, such as scooters, touring motorcycles, non-competitive motorcycles for transporting a rider from one place to another, off-road motorcycles, etc.

30 In spite of the structural elements which have been introduced in very large motorcycles, the movement of the front wheel from right to left and vice versa is still limited. The extent of this limitation is such that, in narrow parking spaces, the parking of a racing motorcycle is very difficult and laborious owing to the

large number of manoeuvres that the motorcycle rider is forced to perform in order to align the motorcycle between the lines delimiting the parking space.

5 The subject of the present invention increases the amplitude of the lateral movements of the front wheel, thus increasing the likelihood of the rear wheel being aligned with the front wheel, in spite of difficulties encountered on the surface of the road or track and,  
10 moreover, facilitating parking of very large motorcycles.

For a correct interpretation, a practical embodiment of the subject of the invention is described by way of non-  
15 limiting example below, with reference to the two appended sheets of drawings, in which:

Figure 1 is a partially sectioned, exploded, perspective view of the front, steerable wheel of a two-wheeled  
20 vehicle and the mechanisms which are attached to the front wheel and to the rear, driving wheel of the vehicle.

Figure 2 shows schematically, the connection of the  
25 rear, driving wheel to the axle of the front, steerable wheel, the horizontal connecting bar being shortened.

Figure 3 is a schematic view of the steerable wheel, sectioned to show the presence of the module, shown  
30 exploded and aligned, which is attached to the rotation axle of the steerable wheel, and the member for connection to the rear wheel.

The invention consists in that, in order to achieve stable equilibrium of the two-wheeled vehicle, preventing the action of the two independent couples which may be created momentarily in known two-wheeled vehicles and which act on the steering column of the vehicle simultaneously and in opposition, the steering column is dispensed with and a module 3 is attached to the rotation axle 1 of the steerable wheel 2, the module 3 being connected at least to an upwardly inclined member 4 which is extended downwardly 5 and is articulated at its end to an end 6 of the transverse connection bar 7 which is connected at its other end to the rear wheel 8 of the vehicle.

15 The axle of the rear wheel 8 thus in turn also bears on the same module 3 as the front wheel 2, as indicated above.

The module 3 is formed by a unit composed of an inner parallelepipedal box constituted by two longitudinal side walls 9 and 9' and two transverse walls 10 and 10' carrying bearings through which the rotary axle 1 extends so as to be attached rotatably to the transverse walls.

25 The longitudinal walls 9 and 9' of the box of the module 3 have respective central pins 11 and 11' which project in opposite directions and which are inserted in respective perpendicularly aligned holes 12 and 12' of flat, superposed and spaced-apart, projecting arms 13 and 13' of the inclined member 4.

In the sides of the body constituting the module 3, means are provided for the angular deflection of the

module 3, and hence of the wheel to which it is permanently connected, to the right and to the left, at will, by the rider.

- 5 These means are, for example, two rigid plate-like tabs 14 and 14' which project from the module 3 at 90° to the pins 11 and 11', the ends of the tabs having respective holes 15 and 15'.
- 10 Pull operating elements (not shown) for enabling the rider of the motorcycle to pivot the module 3, and hence the wheel 2 to which it is permanently connected, to the right or to the left, are fixed in the said holes 15 and 15'.
- 15 As described above, the rear wheel bears on the module 3 of the steerable wheel 2 by means of the bar 7 and the inclined member 4.
- 20 As well as preventing the problems described above in two-wheeled vehicles, the subject of the invention also avoids the designation of space to the conventional steering column, thus freeing the designers of the two-wheeled vehicle from constraints, permitting a better
- 25 mass distribution including the possibility of moving the driver's position forwards.

It is intended that details of construction and finishing which do not alter, change or modify the

30 essence of the invention will be variable.

CLAIMS

1. A method of interconnecting the front and rear wheels in two-wheeled vehicles and a vehicle produced in accordance with the method, characterized in that, in order to prevent two independent couples being generated in the respective wheels and acting on the steering column of the vehicle simultaneously and in opposition, bringing about disequilibrium thereof, the said steering column is dispensed with and a module attached to the rotation axle of the front wheel is connected at least to an upwardly inclined member which is further extended downwardly and is articulated at its other end to an end of a transverse bar for connection to the rear wheel of the vehicle, this wheel taking part in deflections which the steerable wheel may perform.
2. A method of interconnecting the front and rear wheels in two-wheeled vehicles and a vehicle produced in accordance with the method according to the preceding claim, characterized in that the module of the central portion of the steerable wheel is formed by a parallelepipedal body composed of two longitudinal side walls and two transverse walls constituting a box, a pin projecting outwardly from the outer surface of each longitudinal side wall.
3. A method of interconnecting the front and rear wheels in two-wheeled vehicles and a vehicle produced in accordance with the method according to the preceding claims, characterized in that the two transverse walls of the box of the module are perforated in their centres and are provided with bearings for the insertion of the rotation axle of the steerable wheel.

4. A method of interconnecting the front and rear wheels in two-wheeled vehicles and a vehicle produced in accordance with the method according to the preceding  
5 claims, characterized in that the pins of the module of the steerable wheel are inserted in respective holes in two rigid, flat, superposed and aligned arms of the inclined member which is connected to the bar of the rear, driving wheel.

10

5. A method of interconnecting the front and rear wheels in two-wheeled vehicles and a vehicle produced in accordance with the method according to the preceding claims, characterized in that, in addition to the pins  
15 of Claim 2, the module has means for the fixing of pull elements for the angular deflection of the steerable wheel in one direction and in the other, at will, by the rider.

Fig. 1

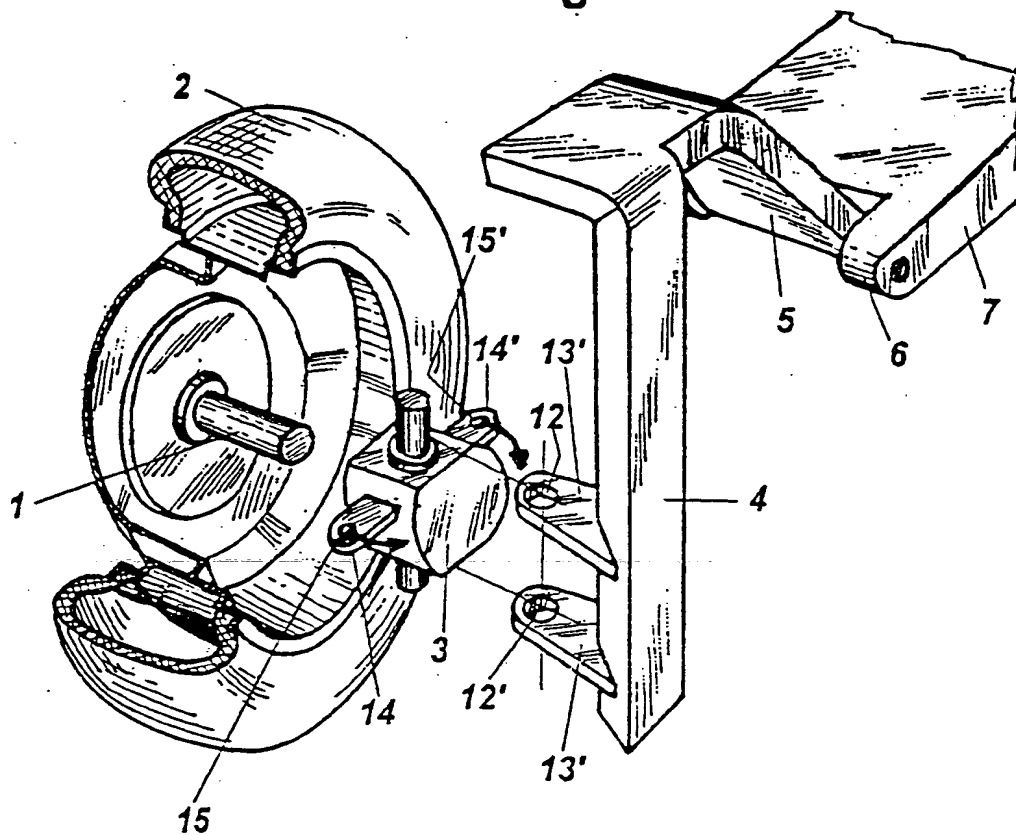
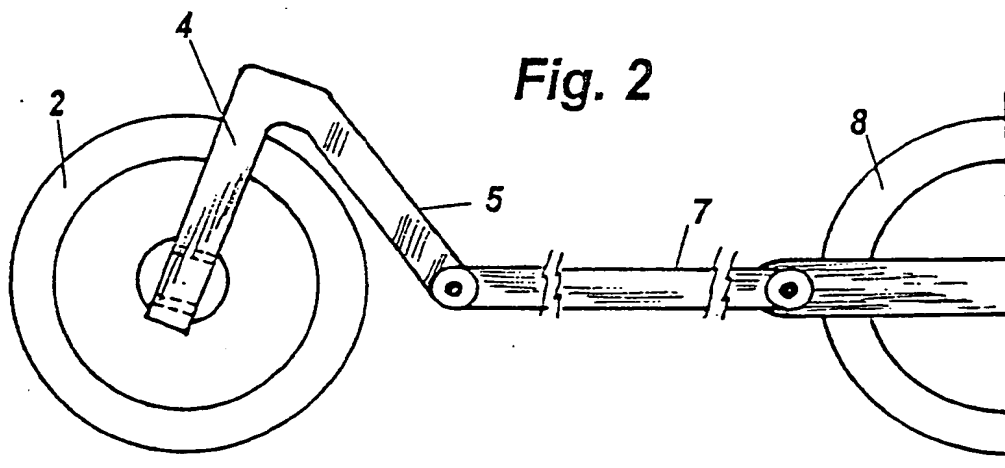
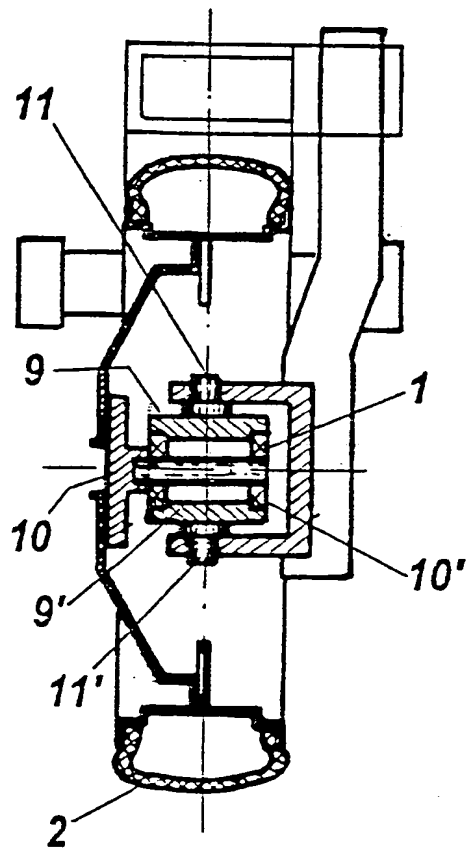


Fig. 2



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*Fig. 3*